RECONNAISSANCE SURVEYS OF CARIBOU AND MUSKOXEN IN PRINCE OF WALES STRAIT AND ON SOUTHERN MELVILLE ISLAND, JUNE 1982 and 1983

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CANADIAN WILDLIFE SERVICE

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ABSTRACT

From 7-9 June, 1982, and 4-6 June, 1983, surveys were flown over Prince of Wales Strait and Amundsen Gulf to determine if caribou (Rangifer tarandus) movements occurred there in the spring. No caribou or trails were sighted, nor were concentrations of caribou observed in coastal areas. Hunters in Holman believe that caribou in small groups cross sporadically between Banks and Victoria islands in fall and winter. They have never observed traditional seasonal movements between Banks and Victoria islands comparable to those that occur at similar latitudes among Prince of Wales Island, Somerset Island, and Boothia Peninsula. As part of a long-term ad hoc monitoring program of portions of Melville Island, muskox (Ovibos moschatus) were surveyed on the south coast and on Bailey Point. On the south coast of Melville Island, 141 muskoxen (no calves) were counted in 1982; 237 (24 calves) in 1983. On Bailey Point, 242 muskoxen (15 calves) were counted in 1982; 286 (36 calves) in 1983. On Bailey Point, the mean group size was smaller ($P < 0.01$) in summer than in winter. The mean group size in winter was inversely related ($P < 0.05$) to the number of muskoxen in the region.

INTRODUCTION

Surveys were conducted in 1982 and 1983 to determine if there was a migration of caribou (Rangifer tarandus) between Banks and Victoria islands in early June. Plans to ship Beaufort Sea oil through Prince of Wales Strait to the eastern Seaboard raised concern that tanker and other marine traffic have the potential to disrupt any inter-island movements of

caribou. Traditional caribou movements occur in early June among Prince of Wales Island, Somerset Island, and Boothia Peninsula (Miller and Gunn 1978, 1979; Miller and Kiliaan 1980). Spring movements were also observed among Prince Patrick, Eglinton, and Melville islands (Miller et al. 1977a). Such spring movements are probably from superior winter ranges to superior summer ranges. Accumulations of ground-fast ice when the snow is melting may be a factor in causing the caribou to move in the spring.

A secondary objective of the reconnaissance surveys was to count muskoxen (Ovibos moschatus) along the south coast of Melville Island and in the Bailey Point region. Only a small amount of extra flying was needed to do those surveys of coastal Melville Island, which repeated similar ones conducted since 1979 (Thomas and Joly 1980; McLaren 1981; McLaren and Green 1982; A. Gunn, pers. comm. 1983). Our reference to the south coast of Melville Island is exclusive of portions west of Cape James Ross.

The Bailey Point region may be a refuge for muskoxen when extreme climatic conditions decimate the herds on less-favourable habitats on the western Queen Elizabeth Islands (Thomas et al. 1981). As such, it may serve as an important source of animals for restocking less-hospitable regions.

One of the potential impacts of the Arctic Pilot Project is a disruption in movements of muskoxen in the Bridport Inlet region where a liquid natural gas plant and tanker terminal are planned. Energy reserves and food supplies for herbivores in arctic regions are known to be precarious in winter, and in years when the snow is harder and deeper than usual, muskoxen and caribou may be malnourished by late winter (Parker

et al. 1975). Extra energy expenditures, as a result of disturbance or displacement from favourable feeding sites, could result in the death of some animals. As well, greater energy expenditures in summer, caused by harassment or disturbance, could result in lowered fat reserves that would reduce an animal's ability to survive the next winter. These surveys were conducted in order to continue the data base obtained in previous years.

Of further interest were the morphological characteristics of the caribou on Victoria Island. Analyses of body, leg bone, skull, and pelage data indicate a cline in the characters of caribou from central Boothia Peninsula to the western Queen Elizabeth Islands (Thomas et al. 1977). With a collection of caribou on Victoria Island, the relationships among food availability, physical condition, and fertility in caribou could be further explored and compared with data for caribou on Prince of Wales Island, Somerset Island, and the Queen Elizabeth Islands (Thomas 1981).

METHODS

Regions surveyed included Prince of Wales Strait and Amundsen Gulf between Banks and Victoria islands, and the adjacent coastal areas up to 6 km inland. The coastal areas of southern Melville Island were surveyed up to 6 km inland from Rea Point to Cape James Ross, and a total count was attained on the peninsula terminating at Bailey Point. Hereafter, the peninsula south of a line joining Hardy Bay and Murray Inlet will be referred to as Bailey Point.

Surveys were flown at elevations of 100-200 magl with a Twin Otter aircraft based in Resolute Bay, Northwest Territories. Transect width was not fixed; it was dependent on the distance from the flight path

that muskoxen and caribou and their sign could be seen. Muskoxen could be seen 3-4 km from the aircraft with the aid of binoculars; caribou at shorter and variable distances, depending on light and snow conditions.

The observer sat in the copilot's seat, and he, the pilot, and an observer in a backseat, scanned the terrain forward and lateral to the flight path. Residents of Holman were hired as observers on flights over Prince of Wales Strait and adjacent regions. All flight lines and observations were plotted on 1:250,000 topographic maps. The details on transect locations and lengths will be included with the results of the surveys.

The percentage of the land that was snow covered was noted as it influences the distribution of the muskoxen and caribou and the visibility of the animals.

During caribou collections in 1983, the aircraft was landed near caribou and an Inuit hunter from Holman and his snowmobile were unloaded. The hunter brought the dead caribou back to the aircraft and the animals were flown to Holman for processing.

RESULTS

Prince of Wales Strait and Amundsen Gulf Region

From 7-9 June, 1982, 1021 km were flown over the channel (Fig. 1), with good visibility for 678 km. No caribou trails or tracks were sighted on the ice. A wind storm approximately 4 days before our arrival had filled in 7-day-old snowmobile tracks and probably any caribou trails.

All 19 caribou observed on 244 km of transects over Victoria Island were cows and immatures. Fourteen were observed 20-30 km inland in an area northeast of Dundas Bay, dominated by tundra ponds and lakes

(Fig. 1). Only three caribou were observed within 2-3 km of the coast; the remaining two, approximately 10 km inland. One group of 16 muskoxen (4 calves) was sighted 26 km inland; another group of two bulls, 2 km inland.

Snow cover was 50 to 60% along the coastal areas up to 6 km inland. It was 70 to 80% 30 km inland in the region of lakes and tundra ponds on Victoria Island.

On coastal Banks Island, from Stewart Point to Alexander Milne Point (118 km), two caribou and 61 muskoxen (7 calves) in 11 groups were counted (Fig. 1).

On June 4, 1983, no caribou trails were seen on transects totalling 820 km over the sea ice in Prince of Wales Strait and Amundsen Gulf (Fig. 1). On June 4 and 5, transects totalling 1615 km were flown over Prince Albert and Diamond Jenness Peninsulas and inland west of the Shaler Mountains. Snow cover was 20-30% in coastal regions up to 12 km inland and 50-60% further inland. Visibility was good on both survey dates. Of the 31 caribou in 16 groups observed on Prince Albert Peninsula, nine were single males located 2-5 km inland. The others, scattered further inland, consisted of seven males, five females, and nine unclassified. A cow and newborn calf were observed 60 km east of Minto Inlet.

On Victoria Island, 266 unclassified muskoxen in 31 groups were observed, including 175 in 15 groups concentrated north and east of Minto Inlet in the Shaler Mountains, and 49 in 11 groups located within 6 km of the coast of Prince Albert Peninsula. The rest were scattered further inland on Prince Albert Peninsula.

We only collected two caribou, males located on the west side of Richard Collinson Inlet. Further collection attempts failed for lack of suitable landing sites caused by an early melt.

On June 6, along the east coast of Banks Island between Jesse Harbour and Russell Point (512 km), we observed 235 muskoxen (35 calves) in 34 groups (Fig. 1). Snowcover was 20-30% in the coastal zone up to 6 km inland.

Coastal Regions of Southern Melville Island

On 7 June, 1982, transects 432 km in total length were flown 2-5 km inland, including 285 km in areas with good visibility (Fig. 2). Within the observed area, snow cover was 95-100%. No caribou and 141 muskoxen (no calves) in 22 groups were sighted. The muskoxen, all located within 4 km of the coast, were concentrated around Little Point (groups of 8, 6, 17, 3 and 8) and Bridport Inlet (groups of 10, 13, 3, 14, 2, 7, 6, and 7).

On 4 June, 1983, no caribou were seen on transects 417 km in total length along the coast of southern Melville Island. A total of 426 muskoxen (52 calves) were observed in 46 groups: 35 (7 calves) in four groups between Rea Point and Nelson Griffith's Point, 237 (24 calves) in 26 groups between Nelson Griffith's Point and Winter Harbour, and 154 (21 calves) in 16 groups between Winter Harbour and Cape James Ross (Fig. 2, Table 2). Average group size (8.1) was slightly higher than in 1982 (6.4/group). Snow cover was 20-30% within 6 km of shore and 50-60% 6-15 km inland.

Bailey Point

On 7 June, 1982, transects 204 km in total length were flown with excellent visibility over snow cover of 95-100%. No caribou and 242

muskoxen (15 calves) in 14 groups were sighted, including 172 within 6 km of the east coast of the peninsula (Fig. 3).

On 4 June, 1983, transects 280 km in total length were flown with excellent visibility over snow cover of 20-30%. No caribou were seen. In the region, 263 muskoxen (40 calves) were observed in 23 groups (Fig. 3). All but 34 (4 calves) in three groups were south of a line joining Hardy Bay and Murray Inlet. That boundary demarcates the peninsula for comparative counts among years. Of those, 216 muskoxen in 18 groups were concentrated in the western half of the peninsula. Calf-others ratios were 1:15.1 and 1:6.9 in 1982 and 1983, respectively.

Average group sizes were 11.7 (others) and 13.4 (calves included) on Bailey Point. This compares with 7.7 (others) and 8.8 (calves included) on the southeast coast from Rea Point to Cape James Ross.

DISCUSSION

Prince of Wales Strait and Amundsen Gulf Area

The absence of caribou movements between Banks and Victoria islands during 7-9 June, 1982, and 4-6 June, 1983, and the absence of concentrations along the surveyed coastal areas, suggest that caribou did not cross Prince of Wales Strait in early June in those years. These observations contrast sharply with those made in previous years in the Prince of Wales Island, Somerset Island, and the Boothia Peninsula region, where, at similar latitudes on the same dates, caribou were concentrated on the west coasts of Somerset Island and Boothia Peninsula and others were

crossing Peel Sound and Franklin Strait to Prince of Wales Island (Miller and Gunn 1978, 1979; Miller and Kiliaan 1980).

Jimmy Memogana, a Holman resident since 1938, stated that caribou in small groups sporadically cross back and forth between Banks and Victoria islands in fall and winter. For example, three caribou were seen on Princess Royal Island sometime before 1977, three caribou were sighted in December, 1981, moving off Ramsay Island towards Banks Island, and caribou were observed crossing Minto Inlet. According to Mr. Memogana, no large scale seasonal inter-island movements have been observed. He stated that caribou spend the summers around the lakes, rivers, and tundra areas of northern Prince Albert Peninsula and the region south of Richard Collinson Inlet. In early fall, they move south towards Minto Inlet and, in November, funnel between Minto Inlet and the Shaler Mountains and onto the Diamond Jenness Peninsula, where they spend the winter. Caribou also move to that peninsula from the Kuujjua River Valley located along the east side of the Shaler Mountains. In spring, caribou funnel back between the west side of the Shaler Mountains and Minto Inlet and calve on Prince Albert Peninsula just north of Minto Inlet. After calving, they move up the northern part of Prince Albert Peninsula to summer there.

Hunter's and Trapper's Association members in Holman commented that in winter 1982-83, considerable numbers of muskoxen moved from Banks Island to Victoria Island across Prince of Wales Strait. Evidence of an eastward movement was still evident in June. In Prince of Wales Strait, muskoxen were concentrated along the Banks Island coast, including 220 muskoxen in 29 groups observed between Stewart and Russell Points. In

contrast, only 25 muskoxen in six groups were seen between Deans Dundas Bay and Peel Point on Victoria Island.

Coastal Regions of Southern Melville Island

Numbers of muskoxen observed along the south coast of Melville Island were higher in 1983 than in any other survey since 1977 (Table 1). This may be, in part, related to the low (20-30%) snowcover within 6 km of the coast compared with 40-60% 6-15 km inland. Calf numbers were comparable to those observed in 1980 and 1981, indicating that by August 1982 many breeding cows had recovered sufficiently from the severe winter of 1981-82 to conceive and successfully deliver calves in 1983.

Calf-others ratios on southeast Melville Island (Rea Point to Cape James Ross) in 1983 (1:6.8) were similar to those found in the Bailey Point region (1:6.6) and on Banks Island (1:6.9). No calves were observed on the south coast of Melville Island by us in 1982 and very few by L.G.L. (McLaren and Green 1982).

In 1982 and 1983, average group sizes in coastal regions from Rea Point to Cape James Ross were 9.3 (n = 46) and 6.4 (n = 22), respectively. These averages include four singles (bulls) in 1982 and one in 1983. Average group sizes for the coastal strip between Nelson-Griffith's Point and Winter Harbour were similar to those in previous years (Table 2).

Bailey Point

Previous estimates of muskox numbers on Bailey Point ranged from 368 to 698 in winter ($\bar{x}$ = 486) and 227 to 543 ($\bar{x}$ = 318) in July and August (Table 3). The variation in estimates within seasons was small except for the winter of 1976 and the summer of 1981. The winter and summer means ($\pm$ SD) were 432 $\pm$ 46 and 243 $\pm$ 46, respectively, if those high values are

deleted and our estimates in 1982 and 1983 are included as summer observations. The significantly higher numbers in winter ($P < 0.01$), even if calves are excluded from the winter totals, indicate movement off the peninsula in the late winter of most years. Emigration usually occurs in May, however, there was an exodus after 4 June in 1983 as A. Gunn (pers. comm.) could find only 177 (53 calves) muskoxen on Bailey Point in August. A slight downward trend since 1973 is indicated by the winter estimates.

Group sizes were significantly larger ($P < 0.01$) in winter (23.0 $\pm$ 9.0 SD) than in summer (10.0 $\pm$ 3.9) (Table 3). Group size was inversely related ($P < 0.05$) to numbers in winter but not in summer. Large groups probably afford more protection against predators and the pressure exerted on groups may be related to the number of groups in the region. For example, in 1976 the 54 groups probably had less pressure to coalesce than the groups that combined into only 11 groups by 23 March in 1977. A wolf den is located at the tip of Hardy Bay and wolves were seen on many of the survey flights over Bailey Point. Other factors such as forage availability, mortality, sex and age structure, and weather (e.g. thermal considerations) no doubt influence group size.

CONCLUSIONS AND RECOMMENDATIONS

In early June, 1982 and 1983, there were no indications of caribou movements between Banks and Victoria islands. Local knowledge is that caribou cross sporadically during fall and winter, but no traditional seasonal movements occur. Timing of these surveys coincided with maximum caribou crossings in Peel Sound at similar latitudes. Further surveys by

snowmobile and aircraft should be conducted in October-November and March-May, respectively.

Any further caribou collections by aircraft should be done March to May when ski landings are possible. Other solutions are snowmobile hunts in cooperation with the local H.T.A. and purchase of specimens from them.

The numbers of muskox calves in the surveyed area on southern Melville Island indicate that muskoxen had recovered from the severe winter of 1981-82. In 1982-83, the muskoxen on Bailey Point appeared to fare better than those in some of the other areas surveyed. Surveys for muskox distributions and numbers on the south coast of Melville Island should be continued periodically in order to document movements and establish trends in population size. Such data are needed as baseline information in the event that large hydrocarbon developments occur in the Canadian Arctic Archipelago.

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Table 1. Numbers of muskoxen sighted along three sections of coastal southern Melville Island from 1977 to 1983.

Date/year	Nelson-Griffith's Point - Beverly Inlet			Beverly Inlet - Bridport Inlet			Bridport Inlet - Winter Harbour			Totals: Nelson-Griffith's Point - Winter Harbour		
	Total	>1 year	Calves	Total	>1 year	Calves	Total	>1 year	Calves	Total	>1 year	Calves
4 June 1983[a]	88	82	6	60	54	6	89	77	12	237	213	24
7 June 1982[a]	56	56	0	55	55	0	16	16	0	127	127	0
29 April-5 May 1982[b]	108			20			70			198		
17 August 1981[c]	65	55	10	2	2	0	54	46	8	121	103	18
5-6 August 1981[c]	29	29	0	59	54	5	34	30	4	122	113	9
26 April 1980[d]	70	65	5	74	70	4	27	24	3	171	159	12
20-21 August 1977[e]	29			49			44			122		
13-14 July 1977[e]	42			54			104			200		

[a]Kiliaan and Thomas, this report.
[b]McLaren and Green 1982.
[c]McLaren et al. 1981.
[d]Thomas and Joly 1980.
[e]McLaren et al. 1977.

Table 2. Average group sizes of muskox herds, exclusive of calves, observed from 1977 to 1983 on the south coast of Melville Islands between Nelson-Griffith's Point and Winter Harbour.

Date and year	No. of groups		Average Number muskoxen/group		Reference
	All sizes	> 1/group	All sizes	> 1/group	
4 June 1983	26	25	8.2	8.5	This paper
7 June 1982	17	16	7.5	7.9	This paper
17 August 1981	13	8	7.9	12.2	McLaren 1981
5–6 August 1981	13	12	8.7	9.3	McLaren 1981
26 April 1980	14	14	11.4	11.4	Thomas and Joly 1980
20–21 August 1977	10	9	9.2[a]	10.1[a]	McLaren et al. 1977
13–14 July 1977	21	17	7.8[a]	9.4[a]	McLaren et al. 1977

[a]Calculated from total counts and calf percentages not specific to the region considered here (McLaren et al. 1977).

Table 3. Estimates of numbers and average group sizes of muskoxen older than 6 months on Bailey Point, 1972–1983. Number of groups (N) are in parentheses.

Year	Date	Number muskoxen > 6 mo.	Mean group size		Reference
			all groups	groups > 1	
1972	6 Apr	457	22.9 (20)	22.9 (20)	F. Miller, pers. comm.; Miller et al. 1977b.
1973	7 Apr	495	21.5 (23)	21.5 (23)	F. Miller, pers. comm.; Miller et al. 1977b.
	2 Aug	273	7.6 (36)	9.5 (36)	F. Miller, pers. comm.; Miller et al. 1977b.
1974	14 Aug	464	14.1 (33)	14.1 (33)	F. Miller, pers. comm.; Miller et al. 1977b.
	30 Jul	314	5.1 (62)	5.8 (53)	F. Miller, pers. comm.; Miller et al. 1977b.
1975	28 Mar	447	20.3 (22)	20.3 (22)	Thomas et al. 1975.
1976	16 Feb	698	12.9 (54)	12.9 (54)	Russell 1976.
	28 Mar	647	13.5 (48)	14.0 (46)	Russell 1976.
1977	23 Mar	410	37.3 (11)	37.3 (11)	Thomas 1978.
1978	14 Aug	234	7.8 (30)	15.6 (14)	Thomas, unpubl. data.
1979	13 Apr	384	32.0 (12)	32.0 (12)	A. Gunn, pers. comm.
1980	21 Apr	368	30.7 (12)	30.7 (12)	Thomas and Joly 1980.
1981	26 Jul	543	13.6 (40)	16.7 (32)	R. Decker, pers. comm.
1982	7 Jun	227	16.2 (14)	16.2 (14)	This report.
1983	4 Jun	233	11.7 (20)	12.8 (18)	This report.
	Aug	124	7.8 (16)	8.2 (15)	A. Gunn, pers. comm.

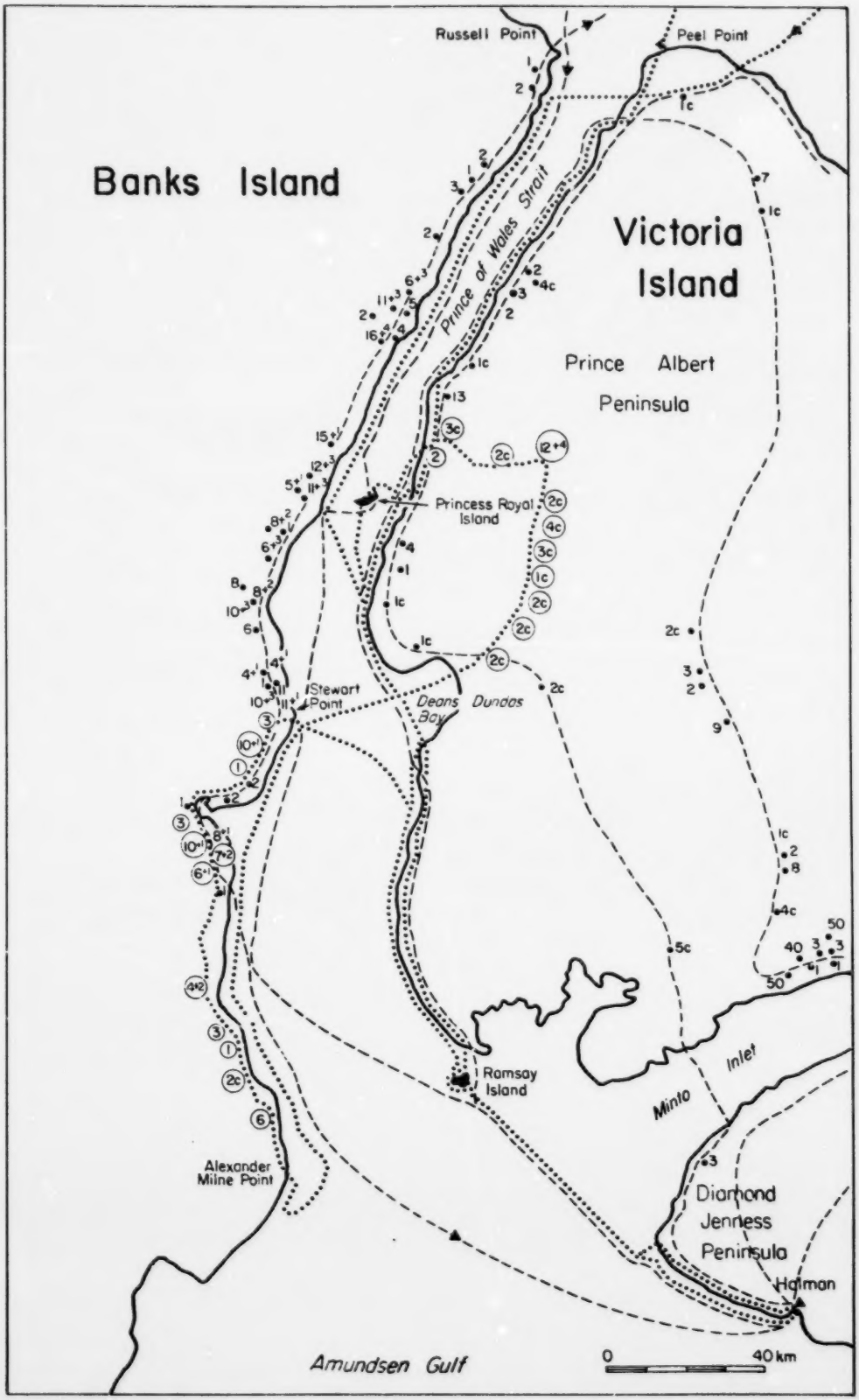

Figure 1. Caribou ("C" after number) and muskoxen ('others' plus calves) observed on flights in the Prince of Wales Strait region on 7-9 June 1982

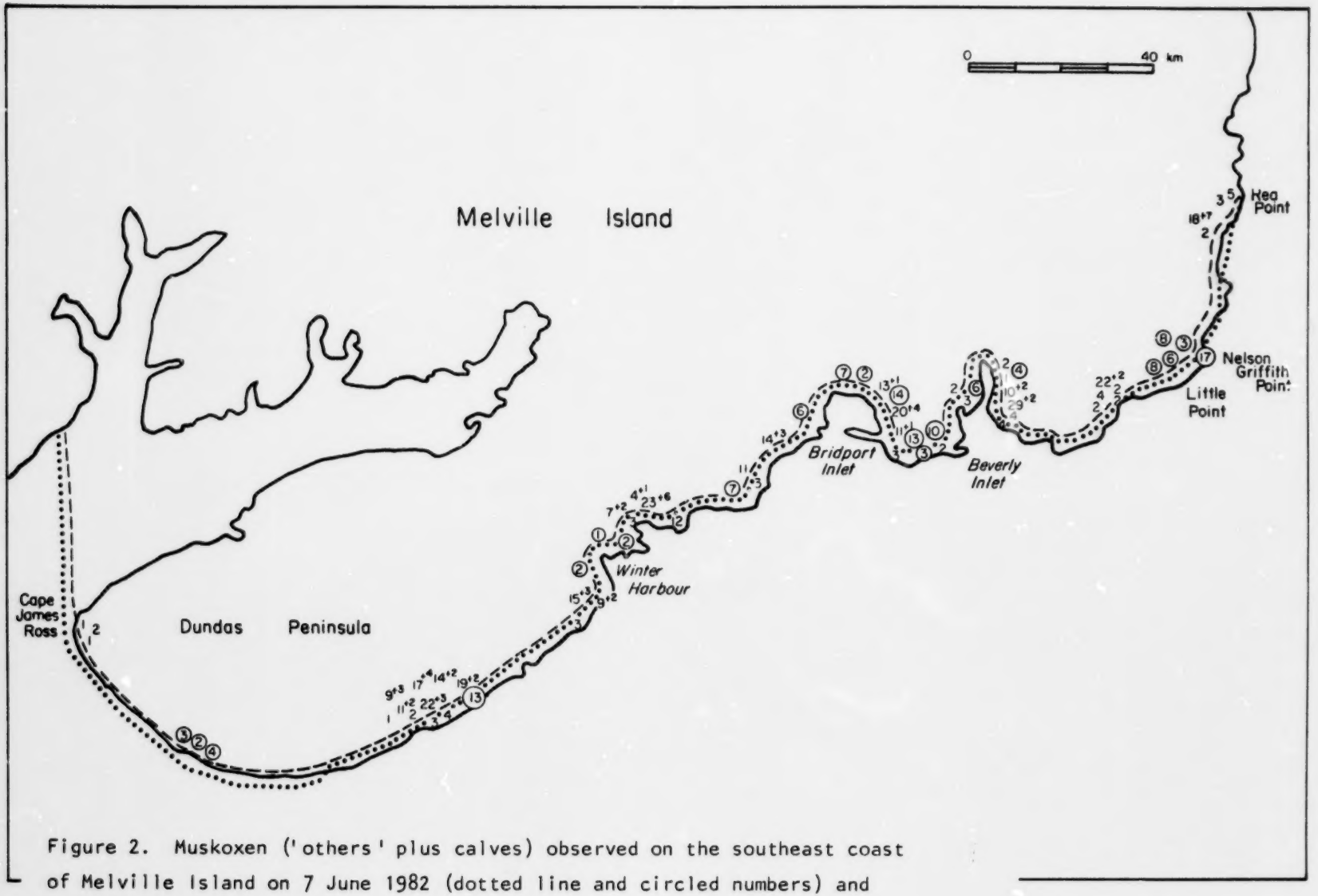

Figure 2. Muskoxen ('others' plus calves) observed on the southeast coast of Melville Island on 7 June 1982 (dotted line and circled numbers) and 4 June 1983 (dashed line).

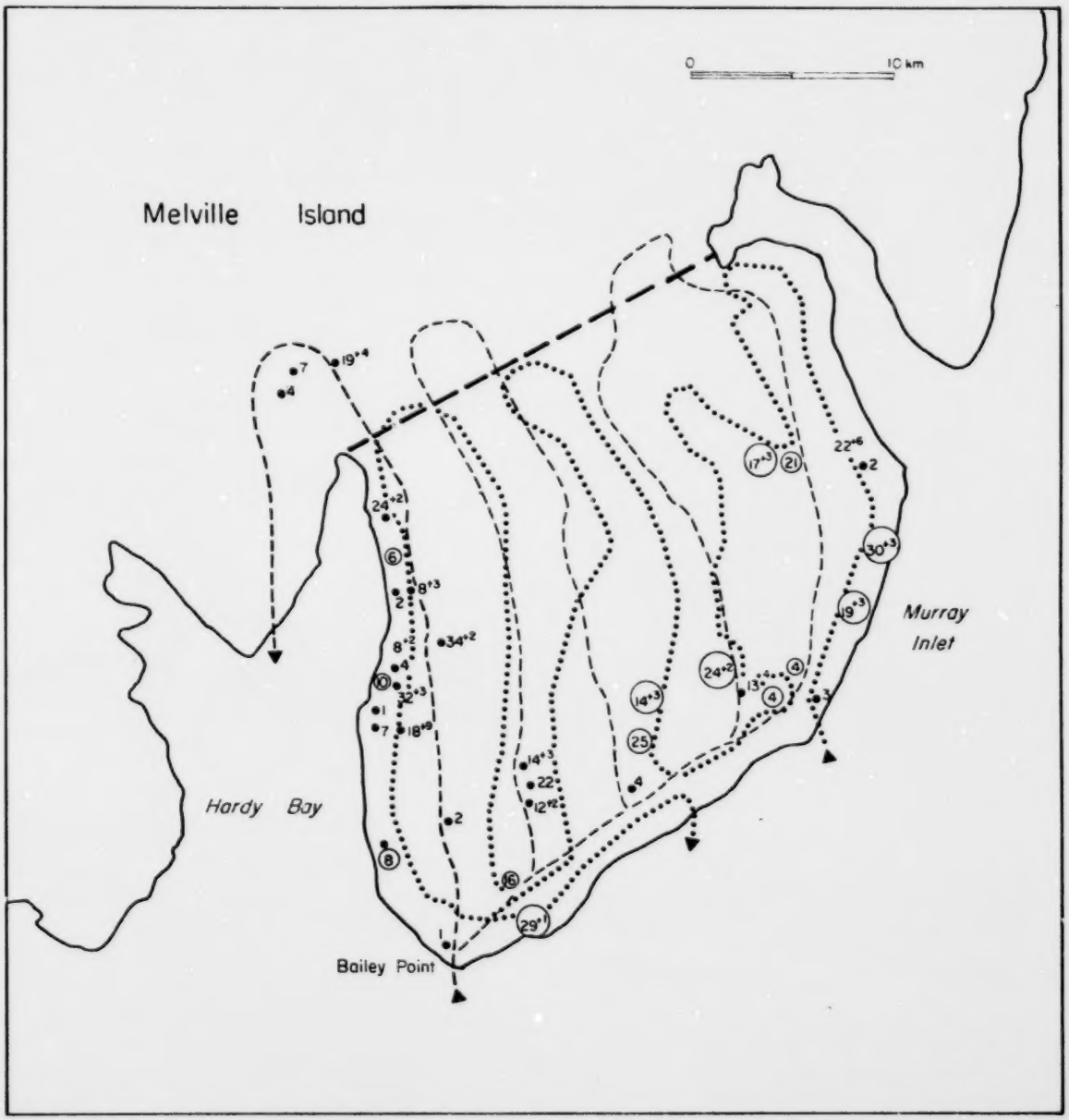

Figure 3. Muskoxen ('others' plus calves) observed in the Bailey Point region on 7 June 1982 (dotted line and circled numbers) and 4 June 1983 (dashed line).